Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

MKP 2000
Remote Control Panel

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Precautions

Safety Instructions • English

⚠ This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

⚡ This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

⚠ Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

⚡ Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

⚠ Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

⚡ Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

⚠ Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

⚡ Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrian implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'Il y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearla ni eliminarla.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desechar las baterías usadas siguiendo las instrucciones del fabricante.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:	Europe, Africa, and the Middle East:
Extron Electronics 1001 East Ball Road Anaheim, CA 92805, USA	Extron Electronics, Europe Beeldschermweg 6C 3821 AH Amersfoort The Netherlands
Asia:	**Japan:**
Extron Electronics, Asia 135 Joo Seng Road, #04-01 PM Industrial Bldg. Singapore 368363	Extron Electronics, Japan Kyodo Building 16 Ichibancho Chiyoda-ku, Tokyo 102-0082 Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Quick Start Guide — MKP 2000

Install and set up the MKP 2000 as follows:

Step 1
Turn all of the equipment off and disconnect it from the power source.

Step 2
Install the cables to and from the control panel in a wall, podium, or desk. See *Rear Panel and Side Panel Connections* in chapter 2, *Installation*, for guidelines.

Step 3
Prepare the wall, podium, desk, or other surface to mount the MKP. See *Preparing the site, installing the mud ring or wall box* in chapter 2, *Installation*.

Step 4
Install the control panel in a wall, podium, desk, or other surface. See *Mounting the MKP to the mud ring or wall box* in chapter 2, *Installation*.

Step 5
Connect the input and output cables. See *Rear Panel and Side Panel Connections* in chapter 2, *Installation*, for guidelines.

Step 6
Connect the power supply. See *Power supply wiring* in chapter 2, *Installation*.

Step 7
Connect power cords and turn on the equipment in the following order: output devices (such as projectors or monitors), the connected matrix switcher, and input devices (such as DSSs or cable boxes).

Step 8
If necessary, set the control panel's and matrix switcher's IP parameters. See *Viewing and configuring the IP and and MKP set-up parameters* in chapter 3, *Local Operation*, or *System Settings Page* in chapter 5, *HTML Operation*.

Step 9
If necessary, set the control panel's RS-232 port for pass-through or no-pass-through mode and whether the MKP is the primary device (connected to the switcher) or secondary device (connected through another device). See *Viewing and configuring the IP and and MKP set-up parameters* in chapter 3, *Local Operation*, or *System Settings Page* in chapter 5, *HTML Operation*.

Step 10

Program the control panel with the size of the connected switcher. See *System Settings Page* in chapter 5, *HTML Operation.*

Step 11

Use the control panel to select inputs and outputs. See *Front Panel Operations* in chapter 3, *Local Operation.*

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MKP 2000 Remote Control Panel

1

Chapter One

Introduction

About the MKP 2000 Remote Control Panel

Introduction

This manual provides installation and operation instructions for the Extron MKP 2000.

About the MKP 2000 Remote Control Panel

The MKP 2000 is a network-ready remote control panel that can control any Extron matrix switcher. The MKP's RS-232 ports allow it to communicate with other devices (another MKP or a matrix switcher) locally and its Ethernet port allows it to communicate with multiple devices.

An MKP 2000 user can remotely create ties by specifying an input and then an output to be tied to the input. The MKP can also be dedicated to a specific group of inputs and outputs when configured using the built-in Web pages.

The MKP 2000 is mounted in a two-gang wall plate that can be installed in a wall, conference table, podium, or other convenient location.

Although the matrix switcher system can have up to 128 inputs and 128 outputs, a conference room may have 3 input devices and 2 output devices, a training room next door may have 4 input devices and 1 output device, and so on. Typically, each room will have one or more MKP control panels assigned to it, with each MKP limited to the inputs and outputs that it can control. In the example in Figure 1-1, the "presentation room" (top center) has one output device, projector (C) and four input devices: a video camera (13), a laptop computer (12) and two PCs (11 and 14). The "Media Room" contains the matrix switcher, as well as other inputs (1-6) and possibility some control device(s).
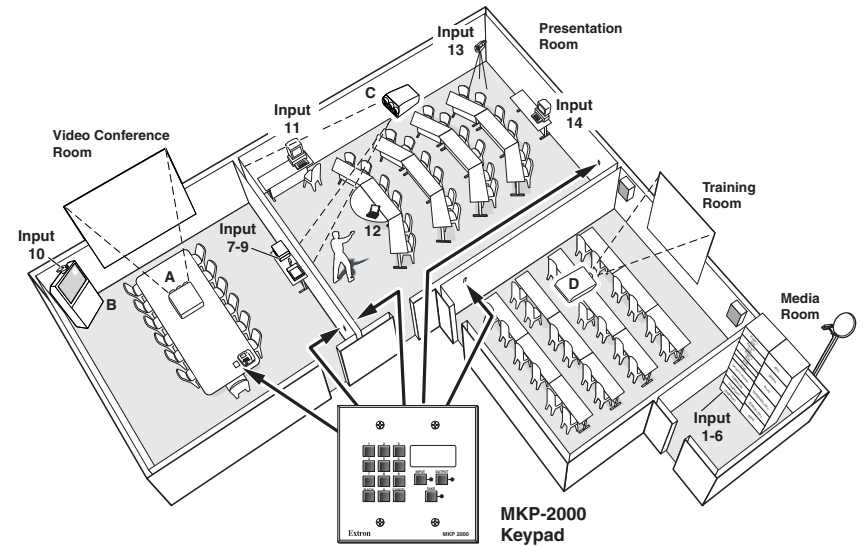
Figure 1-1 — Typical MKP 2000 applications

An overflow crowd in the video conference room and/or the training room may need to see a lecture going on in the presentation room. In this case, the video camera (input 13) must be available to those other rooms, so the MKPs in the video conference and training rooms will be programmed to allow selection of input 13 for displays in those rooms, in addition to any video sources and/or displays in those rooms.

RS-232 connection to the switcher

Any number of MKP 2000s can be connected to a matrix switcher through its RS-232 port, but one MKP must be designated as the primary controller. Other MKPs can be daisy chained through the primary MKP remote control panel.

Ethernet connection to the switcher

Any number of MKP 2000s can be connected to a matrix switcher as part of an Ethernet local area network (LAN).

2

Chapter Two

Installation

MKP Installation Overview

UL Requirements for Wall Box Installation

Installation Procedures

Rear Panel and Side Panel Connections

Installation

CAUTION *Installation and service must be performed by authorized personnel only. UL Listed electrical boxes are recommended. See UL Requirements for Wall Box Installation on the next page.*

The MKP 2000 remote control panel should be installed in a standard, 2-gang electrical wall box (figure 2-1). Figure 2-1 shows the MKP installed in a wall. This could also be in a desk, a podium, or any other convenient location.

The procedures provided here assume that the electrical wall boxes and the cables have been installed for the system. *Rear Panel and Side Panel Connections*, starting on page 2-8 provides guidance for terminating the cables.

MKP Installation Overview

To install an MKP 2000 remote control panel, follow these steps:

1 Disconnect power from the matrix switcher and all MKPs in the system.

2 Prepare the site: cut a hole in the wall/furniture, install the electrical box or mud ring, and prepare the cables. Instructions are included in this manual and/or with the wall box. See *Preparing the site, installing the mud ring or wall box* in this chapter.

3 Connect the cable between the MKP and the matrix switcher. See *Rear Panel and Side Panel Connections* on page 2-8.

4 Connect power cords to the MKP and the matrix switcher.

5 Test the MKP's ability to communicate with the matrix switcher.

6 Disconnect power from all the devices.

7 Mount the MKP into the electrical box or to the mud ring. If using a wall box, see *Mounting the control panel to the mud ring or wall box* in this chapter.

8 Restore power to the devices.

UL Requirements for Wall Box Installation

The following Underwriters Laboratories (UL) requirements pertain to the installation of the MKP 2000 into a wall or furniture (figure 2-1).
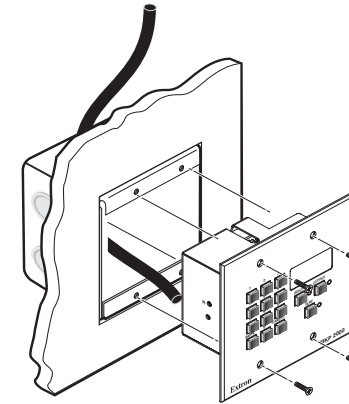
Figure 2-1 — MKP mounted in a wall box

1. These units are not to be connected to a centralized DC power source or used beyond their rated voltage range.

2. These units must be installed in UL listed junction boxes.

3. These units must be installed with conduit in accordance with the National Electrical Code.

Installation Procedures

The MKPs are mounted into a wall, furniture, or any other convenient location. Follow the instructions appropriate to the mounting option you have selected.

CAUTION *The control panel must be installed into an Underwriters Laboratories (UL) approved electrical wall box.*

NOTE *When installing MKP control panels, you must conform to all national and local electrical codes.*

Installation, cont'd

Preparing the site, installing the mud ring or wall box

Choose a location that allows cable runs without interference. Allow enough depth for both the wall box and the cables. You may need to install the cables into the wall, furniture, or conduits before installing the control panel.

The installation must conform to national and local electrical codes and to the equipment's size requirements. An actual-size cut-out template that shows the cutout requirement for the circuitry enclosure on the rear of the control panel is provided in appendix A of this manual.

Installation using a UL listed wall box (available from Extron) is recommended for most mounting options, but the included mud rings can be used instead.

NOTE *Before using the mud rings, verify that the installation conforms to national and local electrical codes.*

CAUTION *Extron provides one mud ring with each MKP control panel. However, the user may choose to use a wall box. Because the tolerances on electrical boxes are very loose, it is recommended that you measure the actual box that you plan to use before making any precise cuts.*

NOTE *The electrical box must be at least 2.5" (7 cm) deep to accommodate the MKP's rear enclosure.*

Install the mud ring or wall box as follows:

1a. **If you are using a mud ring**, use the template that came with the mud ring. Cut out the indicated center portion.

NOTE *To meet the UL listing requirements, this device **must** be installed in a wall box.*

1b. **If you are using a wall box**, cut out or make a 100% size photocopy of the cut-out template in appendix A that corresponds to the faceplate you are using, and cut out the center portion of it as indicated on the template.

2. Place the template (or the wall box or mud ring) against the installation surface, and mark the guidelines for the opening on the wall or furniture.

3. Cut out the wall/furniture material from the marked area.

4. Check the opening size by inserting the wall box, mud ring, or control panel into the opening. The box or mud ring (if used) and/or control panel should fit easily into the opening. Enlarge or smooth the edges of the opening if needed.

5. **If you are using a wall box**, feed cables through the wall box punch-out holes, and secure them with cable clamps to provide strain relief.

6. Exposed cable shields (braids or foil) are potential sources of short circuits. Trim back and/or insulate shields with heat shrink (figure 2-2).
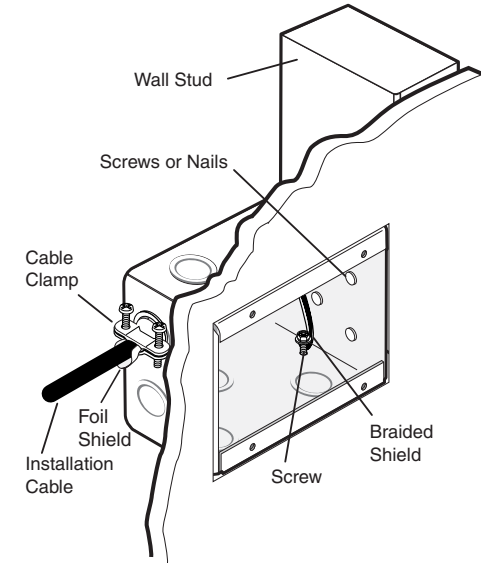
Figure 2-2 — Grounding outer braided and foil shields

WARNING *To prevent short circuits, the outer foil shield can be cut back to the point where the cable exits the cable clamp. Both braided and foil shields should be connected to an equipment ground at the other end of the cable.*

7a. **If you are using a mud ring**, follow the directions, if any, that came with the mud ring to attach the clips that fasten the ring to the wall or furniture (figure 2-3).

NOTE *To meet the UL listing requirements, this device **must** be installed in a wall box.*

Sheet Rock
Backing Clip

0.75" #6-32 Screw

Mounting Bracket

Detail A

Sheet Rock
Backing Clip

1.25" #6-32 Screw

Mounting Bracket

Detail B

Backing Clip can
be in either orientation.
See **Detail A** or **Detail B.**

**Extron
MKP 2000**
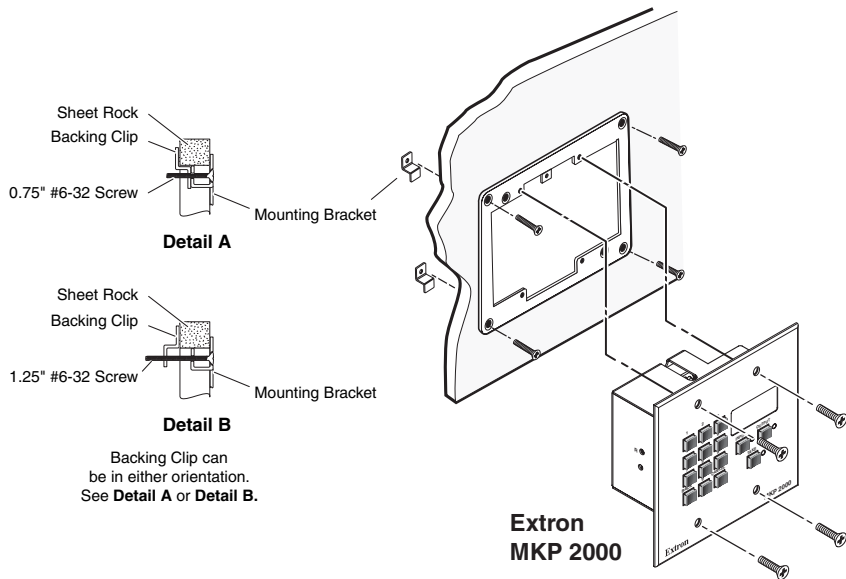
Figure 2-3 — Attaching a mud ring to a wall

7b. **If you are using a wall box**, insert the wall box into the opening, and attach it to the wall stud/furniture with nails or screws, leaving the front edge flush with the outer wall or furniture surface (figure 2-4).

If attaching the wall box to wood, use four #8 or #10 screws or 10-penny nails. A minimum of 1/2 inch (1.3 cm) of screw threads must penetrate the wood.

If attaching the wall box to metal studs or furniture, use four #8 or #10 self-tapping sheet metal screws or machine bolts with matching nuts.

Wall Stud

Wall Box

Flush with
Wall Surface

Screws or Nails
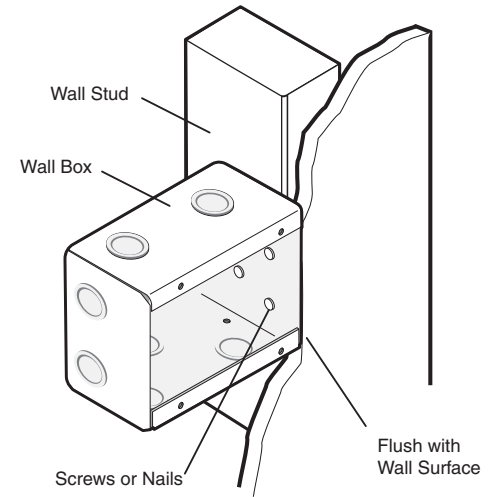
Figure 2-4 — Attaching a wall box to a wall stud

8. Connect the Ethernet and/or RS-232 cable (as appropriate) and the power cable and test the MKP before fastening the MKP into the wall box. See *Rear Panel and Side Panel Connections* on page 2-8, for details.

NOTE *The rear panel connectors will be inaccessible after installation.*

Mounting the MKP to the mud ring or wall box

1. Remove power from the control panel by disconnecting the power supply.

2. Place the control panel through the opening in the wall or furniture and into the wall box. Take care not to damage the cables, which fit behind the MKP, at the back of the wall box.

3. Mount the MKP's faceplate to the mud ring or wall box with machine screws (figure 2-5).
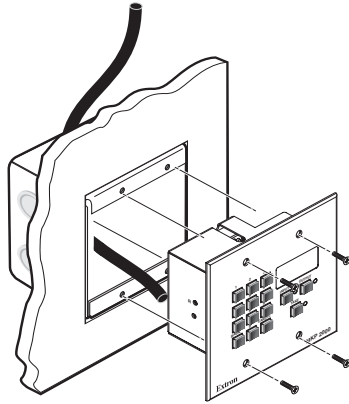
Figure 2-5 — Mounting the MKP to the wall box

4. Reconnect the power supply and restore power.

Rear Panel and Side Panel Connections

All connectors are on the rear or side of the MKP (figure 2-6). These connectors will be inaccessible once the MKP is installed.
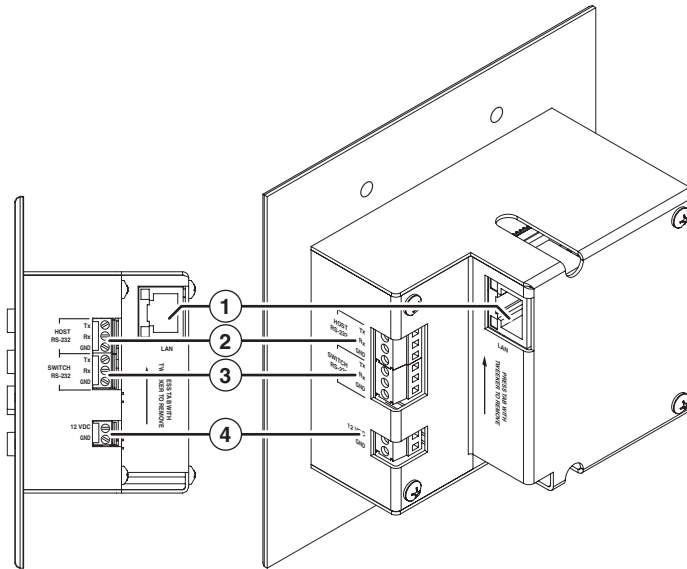
Figure 2-6 — MKP rear and side panels

(1) **LAN (Ethernet) port** — If desired, connect a Category (CAT) 5e or higher (network) cable between this connector and either the matrix switcher to be controlled or to an Ethernet local area network (LAN).

See *TP cable termination*, on page 2-12, to properly wire the RJ-45 connector for your application.

Ethernet connection indicators — The Link and Act LEDs indicate the status of the Ethernet connection. The Link LED indicates that the MKP is properly connected to an Ethernet LAN. This LED should light steadily. The Act LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the MKP communicates.

(2) **Host RS-232 port** — If desired, connect a host computer or control system to this 3-pole, 3.5 mm, RS-232 connector (figure 2-7).

Pin	Function
TX	Transmit data
RX	Receive data
Gnd	Signal ground
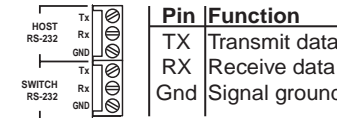
Figure 2-7 — RS-232 connector

(3) **Switcher RS-232 port** — If desired, connect a cable between this 3-pole, 3.5 mm, RS-232 connector and a matrix switcher (figure 2-7).

(4) **Power connector** — Plug the included external 12 VDC power supply into this 2-pole captive screw connector. See *Power supply wiring*, on page 2-14 to wire the connector.

Control connections

The MKP has two RS-232 ports; a Host port (①) and a Switcher port (②); and an Ethernet (LAN) port (③).

An MKP control panel can be directly connected to any Extron matrix switcher through the switcher's RS-232 port (figure 2-8). A control system or host computer can be connected via the MKP's host RS-232 port. Additional MKPs can be connected to the matrix switcher through the MKP that is RS-232 connected to the switcher (the primary MKP). The additional (secondary) MKPs are connected to the primary MKP via the primary MKP's Ethernet port.
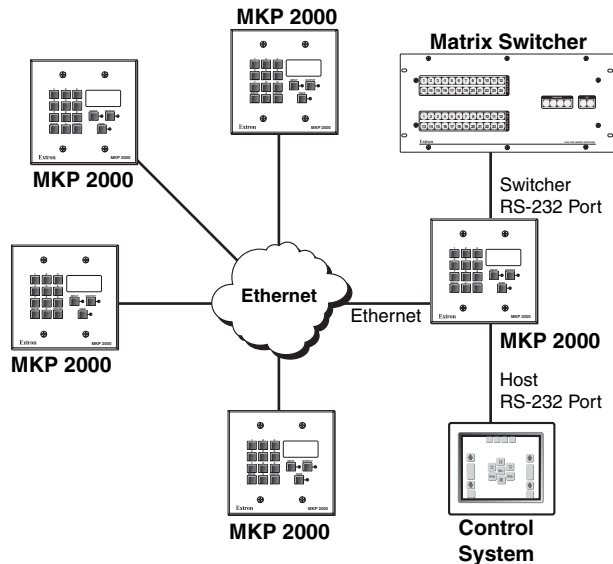
Figure 2-8 — MKP connection using the RS-232 port

An MKP control panel can be directly connected to any Ethernet-enabled matrix switcher via the switcher's Ethernet port (figure 2-9) using a network (TP) cable that is wired as a crossover cable (see *TP cable termination* to properly wire the cable).
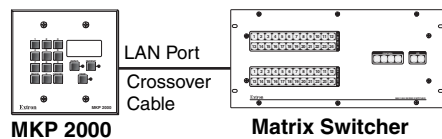
Figure 2-9 — Direct MKP connection using the LAN port

Any number of control panels can be connected, as part of a network, to any Ethernet-enabled matrix switcher via the switcher's Ethernet port (figure 2-10). All TP cables in this example are wired as patch (straight) cables.
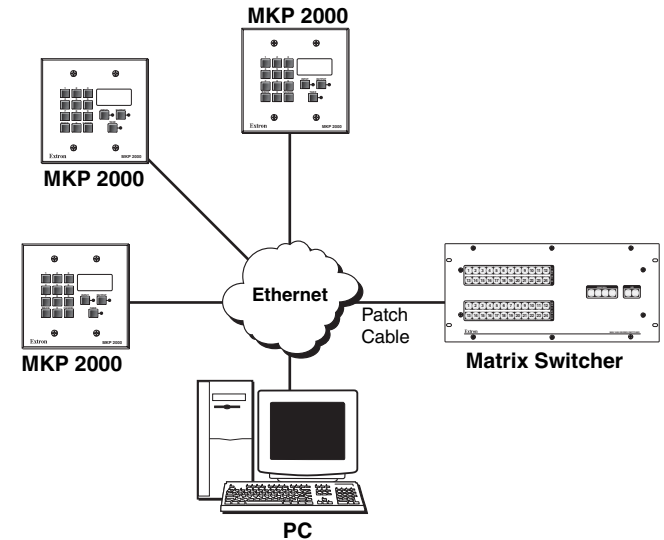
Figure 2-10 — Network MKP connection using the LAN port

RS-232 cable termination

Each MKP control panel has two RS-232 ports that are connected using 3.5 mm, 3-pole direct insertion connectors. Wire the connectors as follows:

NOTE *The total cable length between an MKP control panel and a matrix switcher should not exceed 100 feet (30 m).*

1. Choose a cable such as Extron's Comm-Link cable. The wire specifications for Comm-Link cable are on page A-6. Colors may vary from this example.

2. Trim approximately 1.5" (3.8 cm) of the cable jacket to expose the four insulated wires and a bare drain wire (silver-colored).

3. Cut off the foil shield and discard it.

4. Strip 1/4" (0.6 cm) of insulation from three of the four wires.

5. Twist the strands of each wire, insert them into the direct insertion connector, and tighten the captive screws.

Installation, cont'd

TP cable termination

It is vital that your Ethernet cables be the correct cables, and that they be properly terminated with the correct pinout. Ethernet links use Category (CAT) 5e or CAT 6, unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length 328' (100 m).

NOTE *Do not use standard telephone cables. Telephone cables will not support Ethernet or Fast Ethernet.*

Do not stretch or bend cables. Transmission errors can occur.

The cable used depends on your network speed. The MKP supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex, Ethernet connections.

- 10Base-T Ethernet requires CAT 3 UTP or STP cable as a minimum.

- 100Base-T Fast Ethernet requires CAT 5e UTP or STP cable as a minimum.

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (figure 2-11).

- **Crossover cable** — Direct connection between the MKP and a host computer or an Ethernet-enabled matrix switcher (figure 2-9).

- **Patch (straight) cable** — Network connection between the MKP and an Ethernet LAN (figure 2-10).

Patch (straight) cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-orange
2	Orange	2	Orange
3	White-green	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

Crossover cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-green
2	Orange	2	Green
3	White-green	3	White-orange
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Orange
7	White-brown	7	White-brown
8	Brown	8	Brown

Figure 2-11 — RJ-45 connector and pinout tables

Power supply wiring

Figure 2-12 shows how to wire the connector.
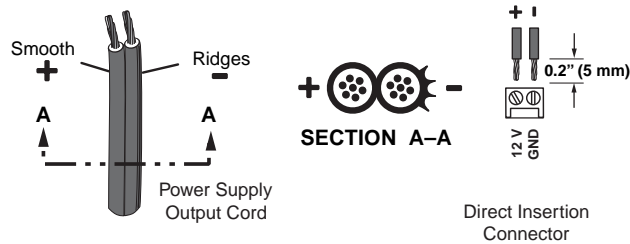
Figure 2-12 — Power connector wiring

CAUTION   *Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the MKP. Identify the power cord negative lead by the ridges on the side of the cord (figure 2-12).*

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

CAUTION   *The length of the exposed (stripped) copper wires is important. **The ideal length is 0.2" (5 mm)**. Longer bare wires can short together. Shorter wires are not as secure in the direct insertion connectors and could be pulled out.*

NOTE   *Do not tin the power supply leads before installing in the direct insertion connector. Tinned wires are not as secure in the connectors and could be pulled out.*

WARNING   *The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.*

Alternatively, an Extron P/S 100 Universal 12 VDC Power Supply, part #**60-357-01**, can power up to ten Extron 12 VDC devices using only one AC power connector.

MKP 2000 Remote Control Panel

Chapter Three

Local Operation

Front Panel Controls and Indications

Front Panel Operations

Rear Panel Resets

Front Panel Controls and Indications
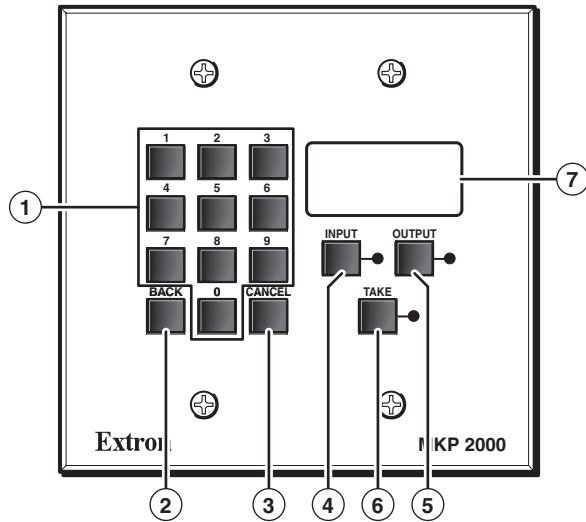
Figure 3-1 — MKP 2000 controls and indicators

① **0, 1 through 9 buttons** — These buttons allow you to enter an input or output when you create a tie.

② **Back button** — This button allows you to delete the least-significant (rightmost) digit of an entered input or output number.

③ **Cancel button** — This button allows you to clear the LED display to 000, erasing any number that you have entered or any error message.

④ **Input button** — This button allows you to specify that the next number that you enter with the numeric keys (①) is an input.

⑤ **Output button** — This button allows you to specify that the next number that you enter with the numeric keys (①) is an output.

⑥ **Take button** — This button confirms the potential tie that you have created with the input and output selection. This button is the equivalent of the Enter button on the matrix switcher's front panel.

⑦ **LED display** — This display shows the input or output number that was most-recently entered using the MKP's numeric keys (①). In certain modes, it can also show the various IP addresses programmed into the MKP.

NOTE   *The LED display shows the most recent input or output number entered on the numeric keys only. Ties created using other devices (other MKPs, a PC or control system, or the matrix switcher's front panel) are not shown in the LED display.*

Front Panel Operations

Creating a tie

1. Press the Input button to specify that the next number entered is an input number.
    * The Input LED lights.
    * The LED display shows the last input selected from this MKP.
    * The last selected output is locked (unable to be changed; assigned as the output to which the entered input is tied unless a different output is assigned [see steps **3** and **4**]).

2. Use the numeric keys to enter the desired input.
    * The LED display shows the input that you enter.
    * The Take LED blinks.

NOTE   *If you push the Take button now, the selected input is tied to the locked output.*

3. Press the Output button to specify that the next number entered is an output number.
    * The Output LED lights.
    * The LED display shows the last output selected from this MKP.
    * The last selected input is locked (unable to be changed; assigned as the output to which the entered input is tied unless a different input is assigned [see steps **1** and **2**]).

4. Use the numeric keys to enter the desired output.
    * The LED display shows the output that you enter.
    * The Take LED blinks.

5. Press the Take button to confirm the change.
    * The Take LED goes out.
    * The LED display show the last output that was tied from this MKP.

NOTE *When an input or output outside the available range for this MKP or the connected matrix switcher is selected, the LED display shows N-A.*

Viewing the last input or output tied from the MKP

Press either the Input button or the Output button.

• The Input or Output LED lights.

• The LED display shows the last tied input or output (depending on which LED, Input or Output, is lit).

NOTE *The LED display shows the most recent input or output number entered on the numeric keys only. Ties created using other devices (other MKPs, a PC or control system, or the matrix switcher's front panel) are not shown in the LED display.*

Viewing and configuring the IP and MKP set-up parameters

To configure the MKP to operate in your LAN system, one or more of the following IP addresses and the host control port setting may need to be changed:

• The MKP's IP address (default = 192.168.254.253)

• The MKP's subnet address (default = 255.255.0.0)

• The MKP's gateway address (default = 0.0.0.0)

• The target matrix switcher's IP address (default = 0.0.0.0)

• Host control port setting (pass-through or no pass-through) (default = no pass-through)

• MKP's connection setting

  ❑ Primary — Controls the switcher directly.

  ❑ Secondary — Controls the switcher through another MKP and its Switcher RS-232 port.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields (octets) separated by dots (periods). Each octet can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per octet, are optional. Values of 256 and above are invalid.

If any of the default address conflict with other equipment at your installation, you can change the IP address(es) to any valid value.

NOTE *Editing the Extron IP address and other parameters while connected via the LAN port can immediately disconnect the user from the MKP. Extron recommends editing this field using the front panel or the RS-232 link*

and protecting the Ethernet access to these parameters by assigning an administrator's password to qualified and knowledgeable personnel only.

Edit these addresses and set the host control setting as follows:

1. Simultaneously press and **hold** the Input, Output, and Take buttons for approximately 2 seconds until the LED display changes and then **release** the buttons.

   • The LED display shows the most-significant (left-most) octet of the MKP's IP address (figure 3-2 on page 3-6).

   • Pressing the Input button changes the IP address shown in the LED display, cycling through the various IP addresses, and then selects the host control setting, as shown in figure 3-2.

     ❑ The Input LED is lit and the Output LED is unlit when the MKP's IP address is displayed.

     ❑ The Input LED is unlit and the Output LED is lit when the MKP's subnet mask is displayed.

     ❑ The Input LED is blinking and the Output LED is unlit when the MKP's gateway IP address is displayed.

     ❑ The Input LED is unlit and the Output LED is blinking when the MKP's target matrix switcher's IP address is displayed.

     ❑ Both the Input LED and the Output LED are lit when the host control setting is displayed.

     ❑ Both the Input LED and the Output LED are blinking when the connection priority is displayed.

   • Pressing the Output button changes the octet of the selected IP address that is shown in the LED display, cycling through the four octets as shown in figure 3-2.

     ❑ No dot (period) appears in the LED display when the most-significant octet is shown.

     ❑ A dot (period) appears to the right of the left-most digit in the LED display when the second octet is shown.

     ❑ A dot (period) appears to the right of the second digit in the LED display when the third octet is shown.

     ❑ A dot (period) appears to the right of the right-most digit in the LED display when the least-significant octet is shown.

Local Operation, cont'd

Simultaneously press and **hold** the buttons for 2 seconds. Release the buttons.

INPUT   **OUTPUT**

The LED display shows the most-significant octet of the MKP 2000's IP address.

TAKE

Press the Output button to cycle through the displayed and editable octets.

OUTPUT   **OUTPUT**   **OUTPUT**   **OUTPUT**

Press the Input button to cycle through the displayed and editable addresses and to reach the MKP set-up settings.

INPUT   **OUTPUT**

MKP 2000's IP Address

| 192 | . | 1.68 | . | 25.4 | . | 253. |

INPUT   **OUTPUT**

MKP 2000's Subnet Mask

| 255 | . | 2.55 | . | 00.0 | . | 000. |

INPUT   **OUTPUT**

MKP 2000's Gateway Address

| 000 | . | 0.00 | . | 00.0 | . | 000. |

INPUT   **OUTPUT**

Matrix Switcher's IP Address

| 000 | . | 0.00 | . | 00.0 | . | 000. |

Most-significant Octet (no dot)   Least-significant Octet (dot in right-most position)

INPUT   **OUTPUT**

Host Control Setting

| nOP | ←→ | PAS |

No Pass-through   Port Pass-through

OUTPUT   **OUTPUT**

INPUT   **OUTPUT**

Connection Priority

| Prı | ←→ | SEC |

Connected to Switcher   Control Though Primary (RS-232)

OUTPUT   **OUTPUT**

Figure 3-2 — Selecting octet fields and host control

2. Use the Input button and Output button to select and display the desired address and octet.

3. Press the Cancel button to clear the octet to 000.

4. Use the 0 through 9 buttons to enter the desired value for the octet.

5. Repeat steps **2** through **4** to select and change other addresses and/or octets.

6. Use the Input button to select the host control setting display.

7. If necessary, use the Output button to toggle the setting between pass-through and no pass-through.

8. Use the Input button to select the connection priority display.

9. If necessary, use the Output button to toggle the setting between primary and secondary.

10. When all addresses and octets and the host control and priority settings are correct, press the Take button.

Host control port setting and pass-through communications

When the MKP is:

- Connected to a computer or control system via its Host RS-232 port **and**
- Is in pass-through mode,

The MKP redirects valid matrix switcher SIS commands that it receives on its Host RS-232 port to its Switcher RS-232 port.

When the MKP is:

- Connected to a computer or control system via its Host RS-232 port **and**
- Is in no pass-through mode,

The MKP acts on all valid MKP commands received. It does not pass the command to its Switcher RS-232 port.

When the MKP is:

- Selected as primary, it directly controls the matrix switcher via its Switch RS-232 port or LAN port
- Selected as secondary,

The MKP controls the matrix switcher through connection to the primary MKP's IP address

Control panel security lockout (executive mode)

The front panel security lockout limits the MKP's front panel operation to input and output selection only (IP address modification is locked).

To toggle the lock on and off, press and **hold** the 1, 3, Back, and Cancel buttons for approximately 3 seconds until the LED display shows the appropriate "LOC" (on or off) message (figure 3-3). When the MKP lock is turned on, the LED display shows "LOC" for three seconds and then "ON" for three seconds. When the lock is turned off, the LED display shows "LOC" and then "OFF" for 3 seconds.

Simultaneously press and hold the buttons.

1   **3**

The LED display shows the LOC message.

BACK   **CANCEL**

3 seconds   3 seconds

LOC → ON
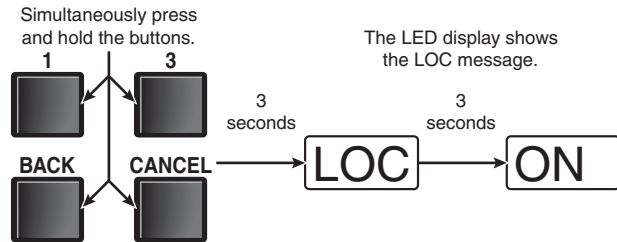
Figure 3-3 — Control panel lockout

Rear Panel Resets

Performing soft resets

The remote control panel has three soft resets available that restore various tiers of MKP settings to their default settings.

- **Events (mode 3) reset** — This function restarts the communications and control events.

- **IP system (mode 4) reset** — IP system reset function resets most IP protocols to their default settings.

NOTE   *IP system reset clears the Internet protocol (IP) settings, but does not reset the target address, the host control setting, the priority setting, or any user-loaded files.*

- **Absolute (mode 5) reset** — Absolute reset performs all of the system reset functions **and** clears the MKP's IP address to 192.168.254.253 and subnet mask to 255.255.0.0. This function is identical to the Esc ZQQQ ← SIS command, see chapter 4, *SIS Operation*).

Perform a soft reset of the MKP as follows:

1.   Press and **hold** the Reset (R) button until the Reset LED blinks off once (events reset), twice (IP system reset), or three times (absolute reset) (figure 3-4).

R ○

Press and **hold** the Reset button.

Events (Mode 3) Reset   **R**

3 seconds

LED flashes **once**.

R

Release, then **immediately** press and release again.

R ○

Press and **hold** the Reset button.

IP System (Mode 4) Reset   **R**

6 seconds

LED flashes **twice**.

R

Release, then **immediately** press and release again.

R ○

Press and **hold** the Reset button.

Absolute (mode 5) Reset   **R**

9 seconds

LED flashes **three times**.

R

Release, then **immediately** press and release again.

Figure 3-4 — Soft resets

2.   Release the Reset button and then immediately press and release the Reset button again. Nothing happens if the second momentary press does not occur within 1 second.

Performing a hard reset

The hard reset function restores the MKP to the original factory default settings, including the default (factory) firmware configuration and the default IP settings. A hard reset performs all of the reset-whole-MKP functions, absolute reset functions, **and** erases all user-installed software or firmware. Perform a hard reset as follows:

NOTE *Ensure that you have backed up any locally-created HTML, JavaScript, or other files that you have uploaded to the MKP's user file space **before** you perform the hard reset. A hard reset **will** **erase** all locally-created files from the MKP.*

1. If necessary, turn off power to the switcher.

2. Press and **hold** the Reset button on the rear panel **while** you apply AC power to the MKP (figure 3-5).

Press and **hold** the Reset button while you apply power to the MKP.

R ◯

The LED flashes on and off.

Power

R ◯ Release the Reset button.

Figure 3-5 — Hard reset

MKP 2000 Remote Control Panel
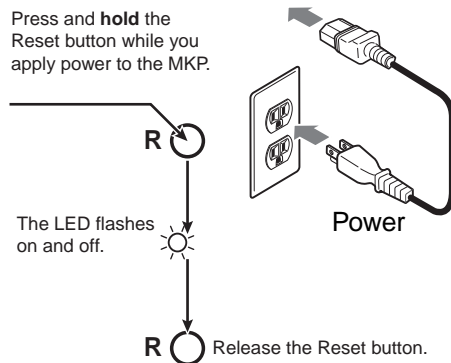
Chapter Four

SIS Operation

RS-232 Links

Ethernet Link

Host-to-MKP Instructions

MKP-Initiated (Unsolicited) Messages

MKP Error Responses

Using the Command/Response Table

SIS Operation

RS-232 Links

The MKP's rear panel 3-pole, 3.5 mm, Host RS-232 connector (figure 4-1) can be connected to the RS-232 serial port output of a host device such as a computer running the HyperTerminal utility, an RS-232 capable PDA, or a control system. This connection makes software control of the control panel possible. The rear panel Switcher connector can be connected to the Remote or RS-232 port of a matrix switcher.

The default protocol for both ports is as follows:

- 9600 baud*
- 8-bit, 1 stop bit
- no parity
- no flow control

Pin	Function
TX	Transmit data
RX	Receive data
Gnd	Signal ground
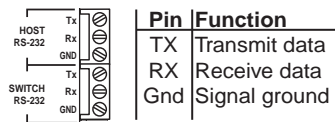
Figure 4-1 — RS-232 connector pin assignments

NOTE **The default baud rate is 9600, but this can also be changed, using the MKP's web pages, to 19200, 38400, or 115200 baud to match the switcher's baud rate. See* Port (RS-232) Settings *in chapter 5,* HTML Operation, *to change the baud rate.*

Routing matrix switcher commands

When the MKP is connected to the matrix switcher via its Switcher RS-232 port, the MKP can redirect SIS matrix switcher commands received on the Host RS-232 port to the matrix switcher.

If the MKP receives a valid matrix switcher SIS command on its Host RS-232 port, it redirects the command to its Switcher RS-232 port only if the MKP is set to Pass-through mode. See the pass-through port redirect command set on page 4-8 to set the Pass-through mode.

Ethernet Link

The rear panel LAN connector on the MKP can be connected directly to a host computer (for set-up) or a matrix switcher (for switcher control) or to an Ethernet LAN or WAN (to which a host computer, other MKPs and a matrix switcher can also be connected).

- Connection **directly** to a host computer requires a **crossover cable**.
- Connection via an Ethernet LAN requires a **patch (straight) cable**.

NOTE *See* TP cable termination *in chapter 2,* Installation *to create crossover and patch cables.*

Default IP address

To access the MKP via the Ethernet port, you will need the Extron IP address. If the address has been changed to an address comprised of words and characters, the actual numeric IP address can be determined using the ping (ICMP) utility. If the address has not been changed, the factory-specified default is 192.168.254.253.

Host-to-MKP Instructions

The switcher accepts SIS (Simple Instruction Set) commands through the Host RS-232 port and Ethernet port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

MKP-Initiated (Unsolicited) Messages

When a local event such as a front panel operation occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below (underlined).

<u>(C) Copyright 2004, Extron Electronics MKP 2000, Vx.xx</u>↵

The switcher initiates the copyright message when it is first powered on or when connection via Internet protocol (IP) is established. Vx.xx is the firmware version number.

↵<u>Password:</u>

The switcher initiates the password message immediately after the copyright message when the controlling system is connected using TCP/IP or Telnet and the switcher is password protected.

This message means that the switcher requires an administrator or user level password before it will perform the commands entered via this link. The switcher repeats the password message response for every entry other than a valid password until a valid password is entered.

↵Login Administrator↵

↵Login User↵

The switcher initiates the login message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the switcher defaults to administrator privileges.

MKP Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (too large)
E10 — Invalid command
E12 — Invalid output number (too large)
E13 — Invalid value (out of range)
E14 — Illegal command for this configuration
E24 — Privilege violation (Ethernet, Extron software only)
E99 — Invalid or no response from target switcher

Using the Command/Response Table

The command/response table begins on page 4-8. Lower case letters are acceptable in the command field except where indicated for the gain and attenuation commands. The table below shows the hexadecimal equivalent of each ASCII character used in the command/response tables.

ASCII to HEX Conversion Table										Esc	1B	CR	ØD	LF	ØA
Space	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	l	7C	}	7D	~	7E	DEL	7F

The MKP always redirects a subset of valid matrix switcher-specific SIS commands on its Ethernet port and, if configured in pass-through mode, on its Switcher RS-232 port.

NOTE *It is not the purpose of this manual to define in detail the passed-through matrix switcher-specific SIS commands. Refer to the applicable matrix switcher's manual.*

Symbols are used throughout the tables to represent variables in the command/response fields. Command and response examples are shown throughout the MKP SIS commands table.

Symbol definitions for MKP SIS commands

↵   = CR/LF (carriage return/line feed) (0x0D 0A)

•   = space

X1 = On/off status   0 = off/disable   1 = on/enable

X2 = RS-232 port number   1 = host   2 = switcher

X3 = n=−1= redirect serial port data from the specified port to allow for a transparent pass through mode. The response is returned with leading zeroes. n = the maximum number of serial ports that the IP link supports. X5 is verified at this port.

X4 = Time (in 10 ms increments) to wait for receive data before releasing the port to another source (min = 1 [10 ms], maximum = 32767 [32.767 seconds], default = 10 [100 ms]).

X5 = Numerical value (*nnnn*) to set L (length of message to receive) or assign as a D (delimiter). L = number of byte count (min = 0, max = 32767, default = 0). D= decimal number for ASCII character (min = 0, maximum = 00255, default = 00000L).

NOTE   *The numeric value directly precedes the identifier; for example: X5 = "3L" to specify a 3-byte length or X5 = "10D" to specify an ASCII delimiter of 0A. The identifier, "L" or "D" must be uppercase.*

X6 = Firmware version   Bootstrap version (*x.xx*)

X7 = Verbose firmware version-description-upload date/time. See page 4-8.

X8 = Voltage 1 (3.3 V), Voltage 2 (12.0 V),
                              Temperature (degrees Fahrenheit) (*xxx.xx*)

X9 = Verbose/response mode   0 = no password assigned
                              1 = verbose mode
                              2 = tagged responses for queries
                              3 = 1 and 2 (verbose and tagged)

NOTE   *The default X9 value is 0 for telnet and 0 for RS-232.*

If tagged responses are enabled, all read commands return the constant string plus the data, the same as setting the value. For example, the MKP responds Ipn•X12 ↵ to the Esc•CN← command.

X10 = Security level   0 = clear/none
                               11 = user password assigned
                               12 = administrator password assigned

X11 = Name   12 characters maximum. Upper and lower case alphanumeric characters and " " + _ : = / and spaces are valid.

NOTE   *The following characters are invalid in the name: + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.*

X12 = Default name   Factory default name (combination of the model name + last 3 pairs of MAC address).

X13 = Time and date (set)   MM/DD/YY-HH:MM:SS
                               where:
                               MM = month: 01 (Jan.) — 12 (Dec.)
                               DD = day: 01 through 31
                               YY = year: 00 through 99
                               HH = hour: 00 through 24
                               MM = minutes: 00 through 59
                               SS = seconds: 00 through 59

X14 = Time and date (read)   Day,•DD•Mmm•YYYY•HH:MM:SS
                               where:
                               Day = weekday: Mon through Sun
                               DD = day: 01 through 31
                               Mmm = month: Jan through Dec
                               YYYY = year: 2000 through 2099
                               HH = hour: 00 through 24
                               MM = minutes: 00 through 59
                               SS = seconds: 00 through 59

X15 = GMT offset   −12.0 through +14.0. Hours and minutes removed from GMT

X16 = Daylight Savings Time   0 = Daylight Savings Time off/ignore
                               1 = Daylight Savings Time on (northern hemisphere)
                               2 = Daylight Savings Time on (Europe)
                               3 = Daylight Savings Time on (Brazil)

X17 = IP address   ###.###.###.###

X18 = Hardware (MAC) address ##-##-##-##-##-##

X19 = Connection priority   0 = Primary
                               1 = Secondary

X20 = Password   12 digits, alphanumeric

NOTE   *The following characters are invalid in passwords: {space} + ~ @ = ' [ ] { } < > ' " ; : | \ and ?.*

X21 = Web page priority   0 = Internal (default on power up)
                               1 = User

Command/response table for MKP SIS commands

Command	ASCII Command (host to MKP)	Response (MKP to host)	Additional description
Front panel security lockout (executive mode)			
Lock front panel	1x	Exe1↵	Lock front panel.
Unlock front panel	0x	Exe0↵	Unlock front panel.
Read front panel lock	x	[X1]↵	Read front panel lock: 1 = locked, 0 = unlocked.
Pass-through (RS-232 port redirect)			
Configure redirect mode	Esc[X2]*[X3]*[X4]*[X5]CD	Cpn[X2]•Ccd[X3],[X4],[X5] ↵	Turn redirect mode on.
Example:	Esc1*2*50*10D*CD↵	Cpn01•Ccd00002,00050,00000L↵	
Disable redirect	Esc[X2]*0CD	Cpn[X2]Ccd00000,00000,00000L↵	
View redirect	Esc[X2]CD	[X3],[X4],[X5] ↵	View redirect mode on/off status.
View, information, part number, and firmware requests			
Information request	I	MKP•2000↵	Report model name.
Request for part number	N	60-682-00 ↵	See Appendix A for part numbers.
Query firmware version	Q	[X6]↵	Firmware version x.xx.
Query verbose firmware version	0Q	[X7]↵	Provide a detailed status of the Ethernet protocol firmware, the MKP controller firmware, and any firmware upgrade. The firmware that is running is marked by asterisk (*). A caret (^) indicates that the firmware has a bad checksum or an invalid load. ?.?? indicates that firmware is not loaded.
Response description:			Ethernet protocol firmware version - controller firmware version - updated firmware version↵
Query status	S	[X8]↵	Voltage and temperature readings.

Command/response table for MKP SIS commands (continued)

Command	ASCII Command (host to MKP)	Response (MKP to host)	Additional description
Resets			
Absolute reset	Esc ZQQQ↵	Zpq↵	Performs all of the reset functions as the master reset, sets the MKP's IP address to 192.168.254.254, and sets the subnet mask to 255.255.0.0.
Verbose mode			
Set verbose mode on	Esc[X9]CV↵	Vrb1↵	The MKP reports all status changes to the device that sent the command.
Read verbose mode	EscCV↵	[X1]↵	
Read connection's security level	EscCK↵	[X10]↵	Password level protection assigned.
IP setup			
Set MKP name	Esc[X11]CN↵	Ipn[X11]↵	Assign a name to the MKP.
Set MKP name to factory default	Esc•CN↵	Ipn•[X12]↵	Reset the MKP's name to the factory default.
Read MKP name	EscCN↵	[X11]↵	Read assigned MKP name ([X11] may be [X12]).
Set time/date	Esc[X13]CT↵	Ipt[X14]↵	Set the time and date.
Read time/date	EscCT↵	[X14]↵	Read the time and date.
Set GMT offset	Esc[X15]CZ↵	Ipz[X15]↵	The divider between hours and minutes is a period.
Read GMT offset	EscCZ↵	[X15]↵	

Command/response table for MKP SIS commands (continued)

Command	ASCII Command (host to MKP)	Response (MKP to host)	Additional description
IP setup (continued)			
Set Daylight Savings Time	Esc, X16 CX ←	Ipx X16 ←	Set the switcher to display the local time as Daylight Savings Time (+1 hour) in summer months.
Read Daylight Savings Time	Esc CX ←	X16 ←	
Set DHCP on or off	Esc X1 DH ←	Idh X1 ←	
Read DHCP status	Esc DH ←	X1 ←	
Set MKP IP address	Esc X17 CI ←	Ipi X17 ←	
Read MKP IP address	Esc CI ←	X17 ←	
Read hardware (MAC) address	Esc CH ←	X18 ←	
Set subnet mask	Esc X17 CS ←	Ips X17 ←	
Read subnet mask	Esc CS ←	X17 ←	
Set gateway IP address	Esc X17 CG ←	Ipg X17 ←	
Read gateway IP address	Esc CG ←	X17 ←	
Set target (switcher) IP parameters	Esc X17 — or — X19 SI ←	Sip X17, X18, X19 ←	
NOTE The set target IP parameters command can be issued with either the X17 or the X19 variable, but not both. The response is as shown regardless of which variable is entered.			
Read target (switcher) IP parameters	Esc SI ←	X17, X18, X19 ←	
Set administrator password	Esc X20 CA ←	Ipa X20 ←	
Clear administrator password	Esc • CA ←	Ipa • CA ←	

Command/response table for MKP SIS commands (continued)

Command	ASCII Command (host to MKP)	Response (MKP to host)	Additional description
IP setup (continued)			
Read administrator password	Esc CA ←	X20 ←	
Set user password	Esc X20 CU ←	Ipu X20 ←	
NOTE When you have connected multiple MKPs to control a switcher through a primary MKP control panel, do not set a user password on the primary MKP.			
Clear user password	Esc • CU ←	Ipu • ←	
Read user password	Esc CU ←	X20 ←	
Switch web page priority	Esc X21 Cpag ←	Iwp X21 ←	
Read web page priority	Esc Cpag ←	X21 ←	
Set verbose mode	Esc X1 CV ←	Vrb X1 ←	Set MKP to report changes from other sources.
Read verbose mode	Esc CV ←	X1 ←	Read the verbose mode.
Read connection's security level	Esc CK ←	X10 ←	

5

Chapter Five

HTML Operation

HTML Operation

The MKP can be configured through its Ethernet port, connected via a LAN or WAN, using a web browser such as Microsoft's Internet Explorer. The browser's display of the MKP's configuration has the appearance of web pages. This chapter describes the factory-installed HTML pages, which are always available and cannot be erased or overwritten.

NOTE *If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your Web browser. In Microsoft's Internet Explore, click Tools > Internet Options > Connections > LAN Settings, uncheck the "Use a proxy server..." box, and then click Ok.*

Download the Startup Page

Access the MKP using HTML pages as follows:

1. Start the Web browser program.

2. Click in the browser's Address field.

3. Enter the MKP's IP address in the browser's Address field.

NOTE *If the local system administrators have not changed the value, the factory-specified default, 192.168.254.253, is the correct value for this field.*

4. If you want the browser to display a page other than the default page (such as a custom page that you have created and uploaded), enter a slash (/) and the file name to open.

NOTE *The browser's Address field should display the address in the following format: xxx.xxx.xxx.xxx/ {optional_file_name.html}.*

NOTE *The following characters are invalid in file names: {space} + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.*

5. Press the keyboard Enter key. The MKP checks to see if it is password protected.

If the MKP is not password protected, proceed to step **7**.

If the MKP is password protected, the MKP downloads the Enter Network Password page (figure 5-1).

Figure 5-1 — Enter Network Password page

NOTE *A User Name entry is not required.*

6. Click in the Password field and type in the appropriate administrator or user password. Click the *OK* button.

7. The MKP checks several possibilities, in the following order, and then responds accordingly:

a. Does the address include a specific file name, such as 10.13.156.10/file_name.html? **If so**, the MKP downloads that HTML page.

b. Is there a file in the MKP's memory that is named "index.html"?
If so, the MKP downloads "index.html" as the default startup page.

c. **If neither of the above conditions is true**, the MKP downloads the factory-installed default startup page, "nortxe_index.html" (figure 5-2), also known as the System Status page.

System Status Page

The System Status page (figure 5-2) provides an overall view of the status of the MKP, including various IP addresses, the status of the Host and Switch RS-232 ports, and the voltage. The System Status page is the default page that the switcher downloads when you connect to the MKP. Access the System Status page from other MKP HTML web pages by clicking the *Status* tab.
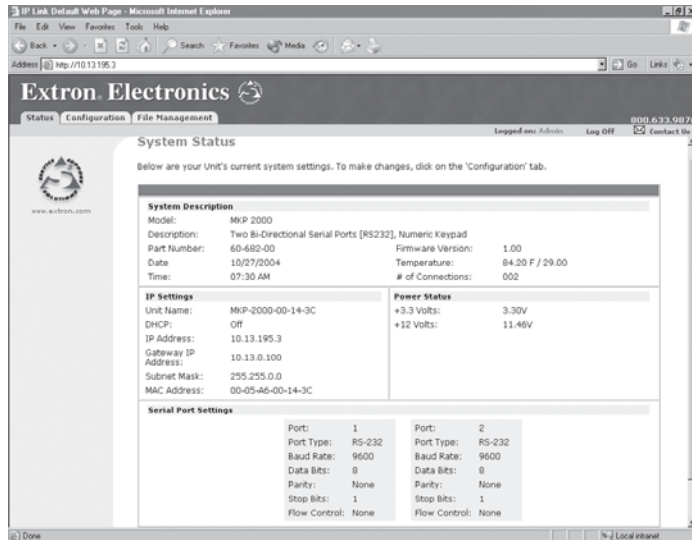

Figure 5-2 — System Status page

System Settings Page

You can change most of the IP parameters on the System Settings page (figure 5-3). Click the Configuration tab or the System Settings link on the left of the Port Settings, Password, or Firmware Upgrade page to download the System Status page.
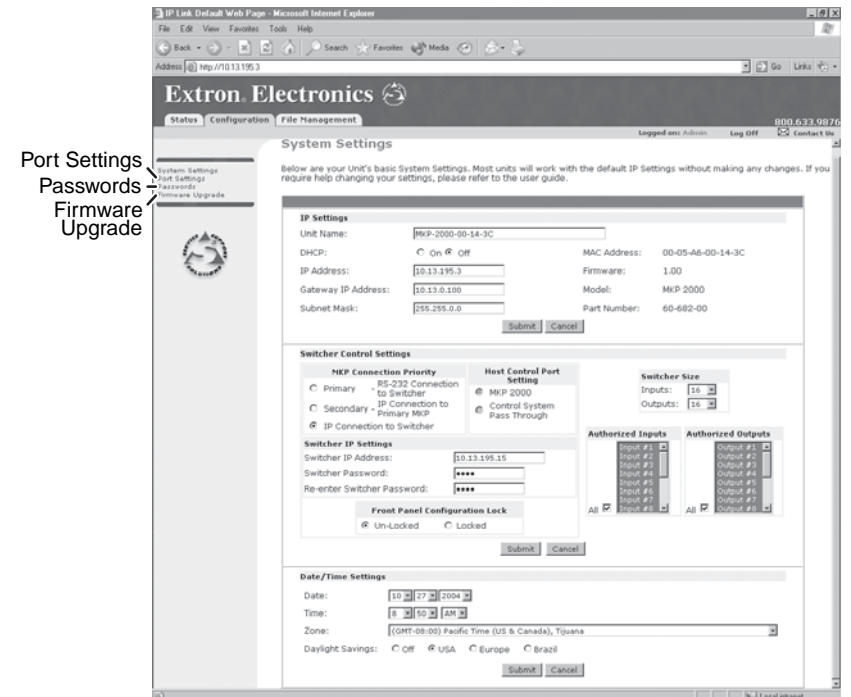
Figure 5-3 — System Settings page

The page is divided into three sections: IP Settings, Switcher Control Settings, and Date/Time Settings. There are three types of controls on the System Settings page: simple fields with no drop boxes, fields with drop boxes, and radio buttons.

Most IP protocol variables, such as the Unit Name, IP Address, Gateway IP address, Subnet Mask, and Switcher IP Address are presented in simple fields.

Most non-IP switcher variables and time and date variables are presented in fields with drop boxes.

On/off and multiple choice selections are radio buttons.

All changes made on the System Settings must be confirmed by clicking the *Submit* button in the appropriate section. Clicking the *Cancel* button abandons the changes.

IP Settings section

Unit Name field

The Unit Name field contains the locally-assigned name of the MKP. This name field can be changed to any valid name, up to 24 alphanumeric characters.

> **NOTE** *The following characters are invalid in the unit name: + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.*

DHCP radio buttons

The DHCP On radio button directs the MKP to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). The DHCP Off radio button turns DHCP off. Contact the local system administrator.

IP Address field

The IP Address field contains the IP address of the MKP. This value is encoded in the MKP's flash memory.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields (octets) separated by dots (periods). Each octet can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The factory-installed default address is 192.168.254.253, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

> **NOTE** *IP address changes can cause conflicts with other equipment. Only local system administrators should change IP addresses.*

Gateway IP Address field

The Gateway IP Address field identifies the address of the gateway to the switcher's to be used if the MKP and the server are not on the same subnet.

The gateway IP address has the same validity rules as the MKP's IP address. The default is 000.000.000.000.

Subnet Mask field

The Subnet Mask field is used to determine whether the MKP is on the same subnet as the switcher's server when you are subnetting. The default is 255.255.000.000.

MAC Address field

The Media Access Control (MAC) Address is hardcoded in the MKP and cannot be changed.

Switcher Settings section

MKP Connection Priority settings

Click the appropriate radio button to select among:

- The Ethernet (IP) port to issue commands to the connected switcher

- The MKP as primary (its Switch RS-232 port connected to the switcher)

- The MKP as secondary (the MKP controls the switcher through another MKP)

Host Control Port settings

If the RS-232 radio button is selected in the Switcher Control Method box, click the MKP 2000 or Control System Pass Through radio button to select that function for the Host RS-232 port.

- **MKP 2000 selected** — Commands received on the Host RS-232 port are executed by the MKP.

- **Pass Through selected** — Commands received on the Host RS-232 port are forwarded to the connected switcher via the Switch RS-232 port.

If the IP radio button is selected in the Switcher Control Method box, the Host Control Port Settings selections are grayed out and unavailable.

Switcher IP settings

If the connected matrix switcher is Ethernet enabled, its IP address and password (if assigned) can be entered in these fields. The address and password are required for the MKP and the matrix switcher to communicate via their RJ-45 LAN connections. The default IP address value is 000.000.000.000.

> **NOTE** *If the Secondary MKP Connection Priority is selected, this section and all of the selections within it are labeled "Primary MKP" rather than "Switcher".*

Switcher Size settings

The MKP cannot determine the matrix size of the switcher to which it is connected. You must use the Switcher Size drop boxes to specify the number of inputs and outputs.

> **NOTE** *When creating ties from the front panel, if an input or output outside the available range for this MKP or the connected matrix switcher is selected, the LED display shows N-A.*

Authorized inputs and authorized outputs

You can use the Authorized Inputs and Authorized Outputs drop boxes to narrow the number of inputs and outputs that are controllable from the MKP.

| NOTE | *When creating ties from the front panel, if an input or output outside the available range for this MKP or the connected matrix switcher is selected, the LED display shows N-A.* |

Front panel configuration lock

Click the appropriate radio button to select the Unlocked or Locked to disable or enable the MKP control panel.

Date/Time Settings fields

The Date/Time Settings fields provide a location for viewing and setting the time functions.

| NOTE | *If setting the time, set the local time. The Zone variable allows you to then enter the offset from Greenwich Mean Time (GMT).* |

| NOTE | *The Zone field identifies the standard time zone selected and displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.* |

| NOTE | *When daylight savings time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Savings Time in the spring and fall on the date that the time change occurs in the United States of America, Brazil, or Europe (depending on the radio button selected). When Daylight Savings Time is turned off, the switcher does not adjust its time reference.* |

Port (RS-232) Settings Page

The Port Settings page (figure 5-4) allows you to configure the MKP's two (Host and Switch) RS-232 ports. Access the Port Settings page by clicking the *Configuration* tab and then the Port Settings link on the left side of the System Settings page.
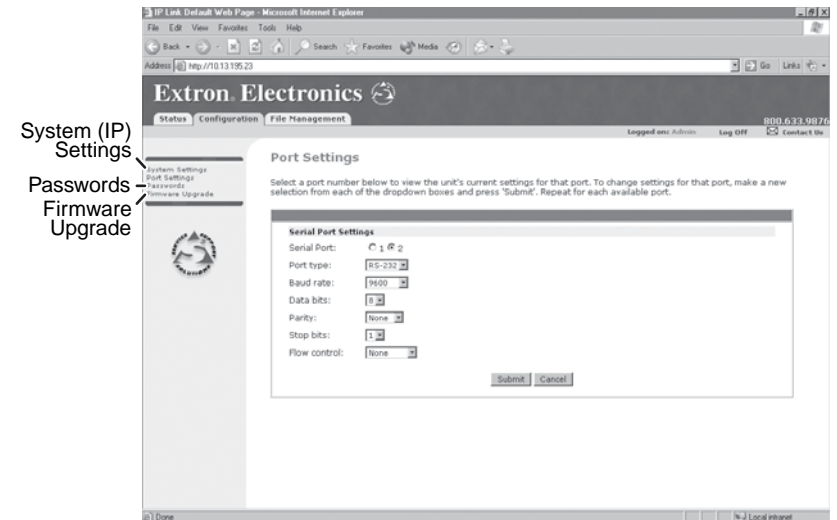
Figure 5-4 — Port Settings page

The Serial Port 1 radio button selects the Host RS-232 port and the Serial Port 2 radio button selects the Switch RS-232 port. All changes made on the Port Settings must be confirmed by clicking the *Submit* button. Clicking the *Cancel* button abandons the changes.

The Extron defaults are shown below, but many switcher models have configurable ports. Extron default RS-232 port settings are:

- 9600 baud   • no parity
- 8 data bits   • 1 stop bit
- no flow control

Passwords Page

Access the Passwords page (figure 5-5) by clicking the Configuration tab and then the Passwords link on the left side of the System Settings page.

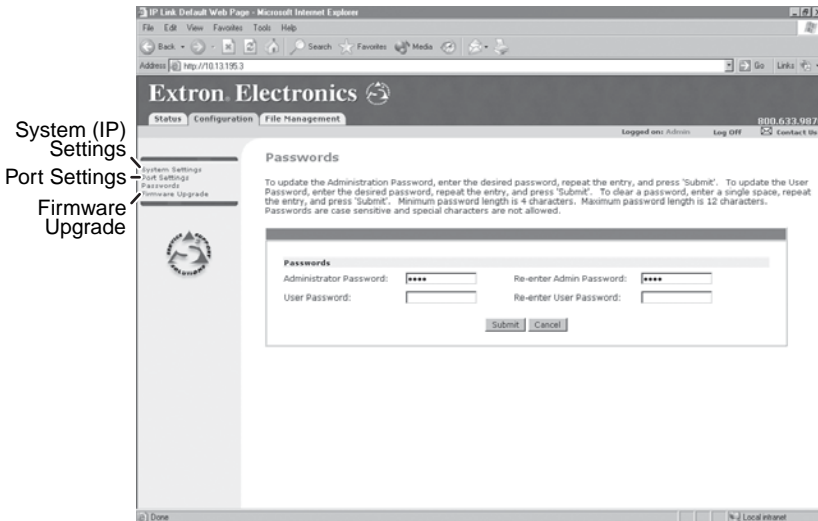System (IP) Settings
Port Settings
Firmware Upgrade

Figure 5-5 — Passwords page

The fields on the Passwords page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 uppercase and lowercase alphanumeric characters. Each password must be entered twice; once in the Password field and then again in the Re-enter Password field. Characters in these fields are masked (•••••). If you do not want to password protect an access level, leave the Password field and the Re-Enter Password field blank. All changes made on the Port Settings must be confirmed by clicking the *Submit* button. Clicking the *Cancel* button abandons the changes.

NOTE *An administrator password must be created before a user password can be created.*

To clear an existing password (so that no password is required), enter a space in the Password and Re-enter Password fields and click the *Submit* button.

NOTE *When you have connected multiple MKPs to control a switcher through a primary MKP control panel, do not set a user password on the primary MKP.*

Firmware Upgrade Page

The Firmware Upgrade page provides a way to replace the firmware that is coded on the MKP's control board without taking the MKP out of service, opening the enclosure, and replacing the firmware chip. Access the Firmware Upgrade page (figure 5-6) by clicking the Configuration tab and then the Firmware Upgrade link on the left side of the System Settings page.

System (IP) Settings
Port Settings
Passwords
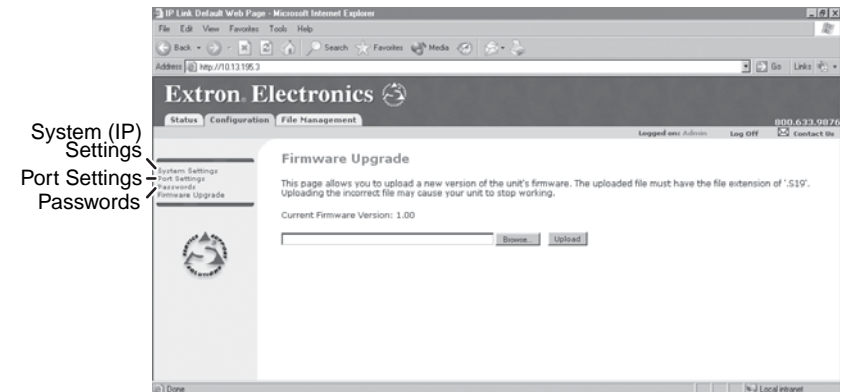
Figure 5-6 — Firmware Upgrade page

Update the switcher firmware as follows:

NOTE *The Firmware Upgrade page is **only** for replacing the firmware that controls all switcher operation. To insert your own HTML pages, see* File Management Page, *on page 5-13.*

1. Visit the Extron web site, www.extron.com and select either:
   • The download tab and then select firmware files
   • The MKP 2000 product page
2. Select the latest firmware file for the MKP and download it. Note the folder to which you save the firmware file.
3. Connect the PC to the MKP via the switcher's Ethernet port.
4. Access the MKP using HTML pages.
5. Click the Configuration tab.
6. Click the Firmware Upgrade link.

HTML Operation, cont'd

7. Click the *Browse* button. An open file window appears (figure 5-7).
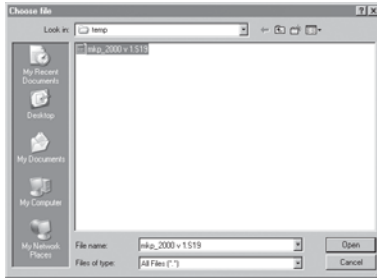
Figure 5-7 — Firmware upgrade open file window

8. Navigate to the folder where you saved the firmware upgrade file. Select the file.

NOTE *Valid firmware files must have the file extension '.S19'. Any other file extension is **not** a firmware upgrade.*

NOTE *The original factory-installed firmware is permanently available on the MKP. If the attempted firmware upload fails for any reason, the MKP automatically reverts to the factory-installed firmware.*

9. Click the *Open* button.

10. Click the *Upload* button. The firmware upload to the MKP may take a few minutes. The MKP's LED display shows **UPL**, then **777**, and then the firmware version number. When the LED display shows **...** , the firmware upload is complete.

File Management Page

To delete files such as HTML pages from the switcher or to upload your own files to the switcher, click the File Management tab. The switcher downloads the file management HTML page (figure 5-8).
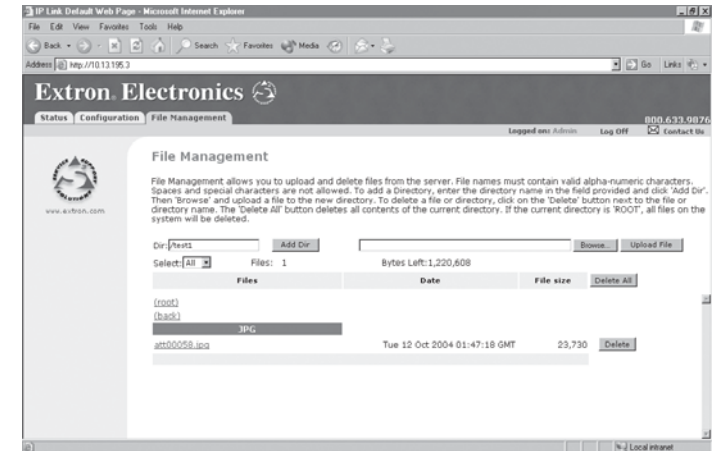
Figure 5-8 — File Management page

NOTE *The files listed in figure 5-8 are shown for example only and may not be present on your switcher.*

To delete a file, click the individual *Delete* button to the right of the file that is no longer needed.

Upload your own files as follows:

NOTE *The following characters are invalid in file names: {space} + ~ @ = ' [ ] { } < > ' " ; : | \ and ?.*

1. Click the *Browse* button.

2. Browse through your system and select the desired file(s).

NOTE *If you want one of the pages that you create and upload to be the default startup page, name that file "index.html".*

3. Click the *Upload File* button. The file(s) that you selected appear in the list.

HTML Operation, cont'd

Special Characters

The HTML language reserves certain characters for specific functions. The MKP will not accept these characters as part of its name, passwords, or locally created file names. Valid file names:

- Are a maximum of 24 uppercase or lowercase alphanumeric characters

- Cannot include spaces or underscore characters

- Cannot start with a number or a dash

- Cannot end with a dash

MKP 2000 Remote Control Panel

Appendix A

Reference Data

Specifications

Part Numbers

Mounting and Cabling Specifications

Reference Data

Specifications

Control/remote — keypad

Extron remote key pad control .. (2) 3.5 mm, 3-pole captive screw connectors

General

External power supply .... 100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 1 A, regulated

Power input requirements .... 12 VDC, 350 mA

Temperature/humidity .... Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing
Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing

Rack mount .... No, but furniture/wall mountable in a wall box

Enclosure type .... Metal

Enclosure dimensions

    Plate .... 4.5" H x 4.6" W x 0.1" D   (2 gang)
(11.4 cm H x 11.7 cm W x 0.3 cm D)

    Enclosure .... 2.7" H x 3.4" W x 2.0" D
(6.7 cm H x 8.6 cm W x 5.1 cm D)
Allow at least 1" (2.5 cm) D for connectors and cable.
(Depth excludes connectors.)

Product weight .... 0.4 lbs (0.2 kg)

Shipping weight .... 2 lbs (1 kg)

Vibration .... ISTA 1A in carton (International Safe Transit Association)

Listings .... UL, CUL

Compliances .... CE, FCC Class A, VCCI, AS/NZS, ICES

MTBF .... 30,000 hours

Warranty .... 3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Part Numbers

MKP 2000 Remote Control Panel	Part number
MKP 2000, black	60-682-02
MKP 2000, white	60-682-03
MKP 2000, RAL 9010 (off white)	60-682-05

Included parts

These items are included in each order for an MKP 2000:

Included parts	Part number
MKP 2000	
12 VDC, 1A external power supply	70-055-01
MKP 2000 user's guide	
Two-gang mounting bracket/mud ring (black, white, RAL 9010 [off white])	70-086-11, 21, 51

Installation accessories

Accessories	Part number
Two-gang "J" box 2.5" deep	980084

Cables

Cables		Part number
Comm-Link Cable:	**Cut lengths:**	
	50 feet (15.2 m)	26-461-01
	100 feet (30 m)	26-461-02
	200 feet (60 m)	26-461-03
	400 feet (120 m)	26-461-04
	Bulk spools:	
	500 feet (152 m)	22-119-02
	1,000 feet (305 m)	22-119-03

Reference Data, cont'd

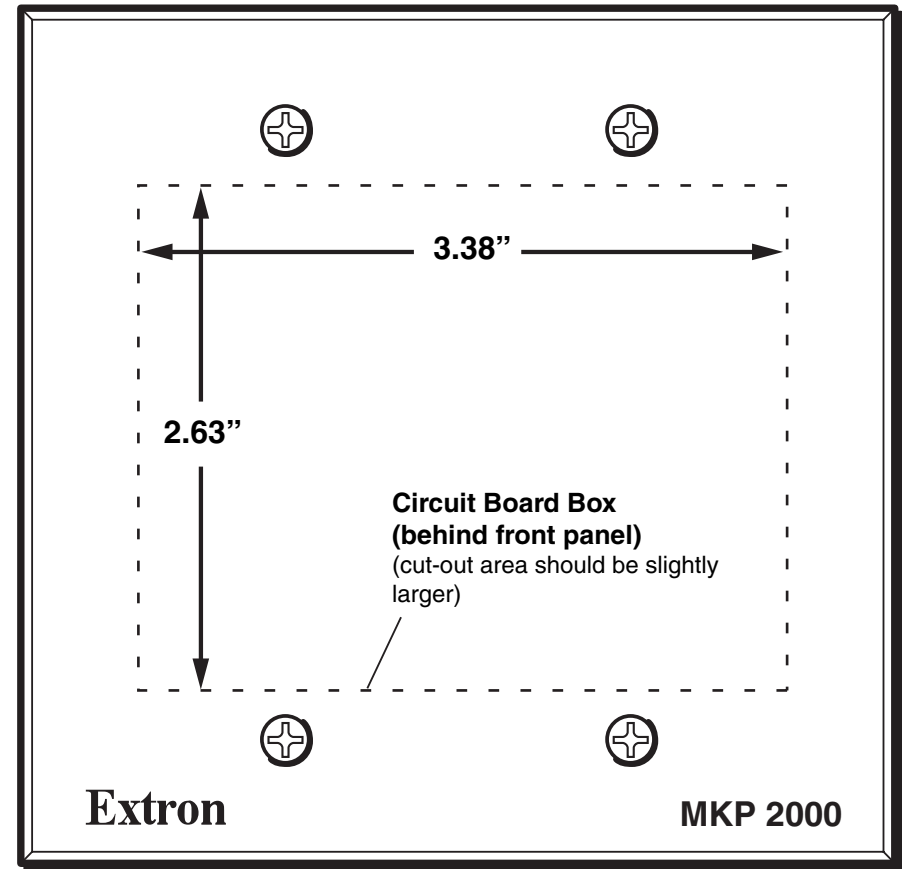### Mounting and Cabling Specifications

Electrical box cutout

Any standard box that meets the local electrical codes can be used, but boxes from different manufacturers can have different size openings. Extron recommends testing the fit of the MKP inside the electrical box and then placing the box flush against the mounting surface and tracing the cutout area.

Panel mount cutout template

Figure A-1 is a drawing that shows the dimensions for cutting a hole to accommodate the keypad circuit board for mounting the keypad on a flat surface. This type of installation can include a desk or podium, or a control panel or dashboard, where the back is protected and does not require an electrical box.

NOTE   *Drawn to scale; may be used as a template.*

3.38"

2.63"

**Circuit Board Box
(behind front panel)**
(cut-out area should be slightly larger)

Extron   **MKP 2000**

Full Size

Figure A-1 — Panel mount cutout template

Reference Data, cont'd

Extron Comm-Link cable

Wire specifications for Extron Comm-Link cable (figure A-2) are as follows:

A (red) = 18 AWG
B (violet or blue) = 22 AWG (grouped and shielded)
C (white) = 22 AWG
D (Drain) = 24 AWG
E (black) = 18 AWG

NOTE   *Comm-Link cable was designed for use with MKP control panels*

Plenum Jacket

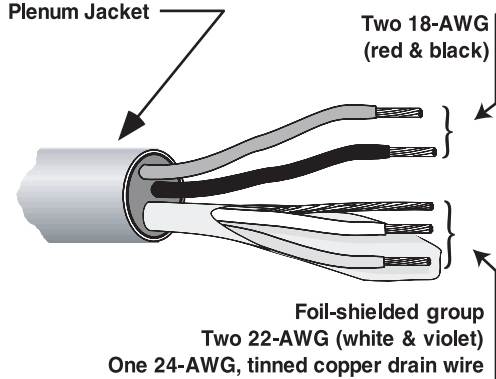Two 18-AWG
(red & black)

Foil-shielded group
Two 22-AWG (white & violet)
One 24-AWG, tinned copper drain wire

Figure A-2 — Comm-Link cable